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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/055,560	01/22/2002	Mou-Shiung Lin	JCLA8532	6103
7590 06/14/2005				
J.C. Patents, Inc. Suite 250 4 Venture Irvine, CA 92618			EXAMINER MITCHELL, JAMES M	
			ART UNIT 2813	PAPER NUMBER

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/055,560

Applicant(s)

LIN ET AL.

Examiner

James M. Mitchell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 March 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 139-241 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 139-241 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/28/2005.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

This office action is in response to the election made March 28 2005.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 223-241 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicant claims that no die is under the passive component, but where a passive component is formed over the die having a top surface at a horizontal, the die is located below and therefore under the passive component.

Claims 223-241 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no support in the specification for a passive component formed over the die having a top surface at a horizontal, but there is

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no die under the passive component; if the passive component is formed over the die then the die is under the passive component.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 139-141, 144-152, 154-156, 158-160, 166-168, 170-172, 175-181, 183-185, 191-193, 195-197, 200-206, 208-210, 212, 214 and 220-222 are rejected under 35 U.S.C. 102(e) as being anticipated by Towie et al. (U.S. 2002/0074641).

Towie (Fig. 17, 22, 32-34) discloses:

(cl. 139, 156, 160, 170, 184, 185, 195, 222) a chip packaging method comprising joining at least a die (314) to a substrate (302), after joining, depositing metallization/ trace (120) separated by dielectric layer that form a passive device (capacitance) over the said substrate and separating said substrate ("singulated"; Par. 0047);

(cl. 140, 166, 167, 171, 191, 192, 196, 197, 220, 221) with the substrate comprising copper or aluminum bulk metal (Par. 0038);

(cl. 141,172) and forming cavity (304) for accommodating die;

(cl. 144, 159, cont. 195, 214) and the passive over the horizontal (i.e. match where top of die is level with top of substrate);

(cl. 145) with at least one die having a lower surface joined (352) to said substrate;

(cl. 147,152, 175, 179, 201, 206) wherein depositing at least a trace over said horizontal comprises electroplating (0024) that is electrically connected to passive (i.e. conductors separated by dielectric forms capacitor);

(cl.148) depositing a dielectric (124) over horizontal followed by at least one trace (120);

(cl. 149, 151, 176, 178, 203, 205) where the dielectric comprises polyimide (Par, 0023);

(cl. 150, 177, 200,202, 204) after depositing trace depositing a dielectric over trace (Fig. 8)

(154, 183, 208) with multiple active devices (devices within active surface, 316) and transmitted (240, 324; Fig. 34) from one active device to another active device through a trace (i.e. first metallization closest to die, not labeled);

(155, 156, 180,181, 209, 210) with multiple bonds (i.e. 258) being solder (Par. 0033);

(cl. 158) with at least one die having a top surface (active, 316) at a horizontal level (i.e. matching with substrate top) with bonds over horizontal level;

(cl. 168, 193, 212) by mechanically cutting (Par. 0037)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 161, 186 and 215 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towie (U.S. 2002/0074,647) as applied to claim 139, 170 and 195 and further in combination with Honda (J.P 360004253).

Towie does not appear to show the passive component being a resistor, inductor.

Honda (English Abstract) teaches incorporating passive component such as a resistors (R) into its interconnect (i.e. dielectric & metallization).

It would have been obvious to one of ordinary skill in the art to incorporate passive component such as a resistors into the interconnect of Towie in order to improve integration density as taught by Honda (English Abstract).

Claims 162, 187 and 216 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towie (U.S. 2002/0074,647) as applied to claim 139, 170 and 195 and further in combination with Aoki (U.S. 6,545,354).

Towie does not appear to show the passive component being an inductor.

Aoki (31; Col. 8, Lines 22-29) teaches incorporating passive component such as an inductor into its interconnect (i.e. dielectric & metallization).

It would have been obvious to one of ordinary skill in the art to incorporate passive component such as an inductor into the interconnect of Towie in order to eliminate cross talk as taught by Aoki (Abstract).

Claims 163-165, 188-190 and 217-219 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towie (U.S. 2002/0074,647) as applied to claim 139, 170 and 195 and further in combination with Tahara et al. (U.S 2002/0017730).

Towie does not appear to show the passive component being MEMS, filter or wave above the active component.

Tahara utilizes passive components such as a filter, MEMS or wave above the active component (Par. 0069).

It would have been obvious to one ordinary skill in the art to incorporate such passive components in order to provide a wireless function as taught by Tahara (Par. 0069).

Claims 142, 173 and 198 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towie et al. (U.S 2002/007464) as applied to claims 131, 170 and 195 and further in combination with Mu (U.S. 2002/10070443).

Towie does not appear to explicitly disclose that the metal substrate is formed of a first and second metal.

Mu discloses a cavity formed of a first and second metal (102, 112; Fig 19).

It would have been obvious to form the cavity from a first and second metal layer since multiple pieces being made integral are functional equivalents and have been held to be mere choice. See In re Larson, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965) (that the use of a one piece construction instead of the structure disclosed would be merely a matter of obvious engineering choice.)

Claims 143, 174 and 199 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towie (U.S 2002/007464) and Mu et al. (U.S 2002/0070443) as applied to claims 142, 173 and 198 and further in combination with Juskey et al. (U.S 6,507,102).

Mu does not show forming holes by punching.

Juskey teaches forming holes by punching (Col 4, Lines 53-55).

It would have been obvious to one of ordinary skill in the art to form the hole/opening of Mu by punching in order to form a hole as is required by Mu (Fig.8).

Claims 153, 207 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towie (U.S. 2002/0074,647) as applied to claim 146 and 200 and further in combination with Murakaki et al. (U.S 5,892,288).

Towie does not appear to disclose the use of sputtering.

However Towie discloses the same invention except that its process for forming connections are plating instead of sputtering, Muraki (Col. 8, Lines 14-16) shows that plating and sputtering are equivalent processes known in the art for forming



connections. Therefore, because these two processes are art recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute a plating process for a sputtering process.

Claims 157, 182 and 211 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towie (U.S. 2002/0074,647) as applied to claim 155, 180 and 209 and further in combination with Muraki et al. (U.S. 5,892,288).

Towie does not appear to disclose its balls are gold.

However Towie discloses the same invention except that its connections are made through balls of solder instead of gold, Muraki (Col. 8, Line 23) shows that gold and solder form equivalent structures known in the art for forming contacts. Therefore, because these two contact structures are art recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute gold for solder.

Claims 169, 194 and 213 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towie (U.S. 2002/007464) as applied to claims 139, 170 and 195 and further in combination with Kobayashi (U.S. 6,794,739).

Towie does not disclose the its cutting process as a laser, however Kobayashi (Col. 17, Line s16-20) teaches laser cutting.

It would have been obvious to one of ordinary skill in the art to incorporate using a laser on the substrate of Towie in order to divide the substrate as taught by Kobayashi (Col. 17, Lines 16-20) which causes separation.

### ***Response to Arguments***

Applicant's argument based on his new amendment is deemed unpersuasive.

Applicant merely states that the prior art does not show "...after joining.. depositing passive device...and separating..." without further explanation as to why the prior art does not disclose this limitation. In an effort to expedite prosecution, examiner has addressed this allegation. Because Towie discloses a chip with its active surface is joined to the substrate prior to forming an interconnect layer over the die, which comprises a passive component as explained in the office action and then is separated, the broad scope of the claim is encompassed in the prior art. In addition, the teaching references used in this office action disclose passive components (i.e. inductors) formed over a chip's active surface and dielectric layer, which according to Towie, is not formed until after the chip/die is joined to its substrate. Because of the stated reasons, applicant's allegation is deemed unpersuasive.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art in Dirhoui et al. (U.S. 6,281,583) discloses

capacitance between conductive lines; and in Kim (U.S. 2002/0185738) the use of passive components in an interconnect layer.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Mitchell whose telephone number is (571) 272-1931. The examiner can normally be reached on M-F 8:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jmm  
January 10, 2005



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June 12, 2005